Feature Story

The powerful explosions in Beirut and Tianjin: 5 years apart; both caused by improper storage of hazardous chemicals

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Thousands of tons of highly explosive ammonium nitrate is being explored as responsible for a powerful blast in Beirut, Lebanon that left at least 135 people dead and some 5,000 wounded on August 4, 2020.

2020 Beirut explosion (AFP photo)

Five years ago, a massive explosion due to the improper storage of chemicals also struck Tianjin, China on August 12, 2015.

Just like the devastating explosion in Beirut, Tianjin also saw a giant fireball that shot into the air as debris rained down on surrounding structures.

Investigations on the Tianjin explosion concluded that it has been caused by the illegal storage of thousands of tons of hazardous chemicals including nitrates, flammable materials, and toxic compounds contained at the station, according to the international knowledge platform for disaster risk reduction, PreventionWeb.

In Beirut the day following the blast, the Lebanese authorities have focused their investigation on how a 2,750-ton cargo of ammonium nitrate was left sitting inside a warehouse since it was confiscated from a Russian ship in 2013.

Initial reports show that the chemical commonly used in fertilizers and explosives was likely accidentally ignited by a welding work before the blast.

The explosion was so powerful that it ripped through the city leaving much of the port wiped out and hundreds of buildings damaged.

Five years ago, the massive explosion in Tianjin due to the improper storage of chemicals killed 173 people, injured 700, and destroyed hundreds of homes in the densely populated area. Among the deceased were 104 firefighters, considered the largest loss of firefighters on duty in the history of modern China.

2015 Tianjin explosion (AFP Photo)

According PreventionWeb, the explosion at a Tianjin warehouse yard in August 2015 was “one of the most tragic industrial accidents in China.”

An explosion crater showed the blast's grim devastation in Tianjin, while much of Beirut's port has been wiped out.

Based on a Washington Post's report, Beirut neighborhoods near the port are lined with apartments, clubs and restaurants. Many of those buildings were flattened by the explosion.

The blast in Beirut was measured as a magnitude 3.3 quake, while it was equivalent to a 2.2-magnitude tremor in Tianjin.

Washington Post also reported that the number of injured in Beirut strained the capacity of hospitals. In the Tianjin explosion, BBC reported that hospitals struggled to cope with the number of casualties.

Similar to the Tianjin blast, the improper storage of ammonium nitrate is also seen as the likely source of the explosion in Beirut.

Washington Post reported that concerns have emerged in areas near the blast site in Beirut over the release of potential toxins into the air.

PreventionWeb cited that firefighters and medical first responders in the Tianjin explosion were unaware of the dangerous chemicals involved in the blasts. "As a result, water from fire hoses reacted with volatile chemicals during the initial response, which many feared released toxic compounds into the air and water system," it said.

What is ammonium nitrate?

According to the Nortech Laboratory, ammonium nitrate is an odorless, colorless or white, crystal salt produced by the reaction of ammonia and nitric acid.

Ammonium nitrate is an important component of many fertilizer mixtures and is not harmful if handled properly.

However, it noted that inhalation of high concentrations of ammonium nitrate dust can cause respiratory tract irritation, manifested by cough, sore throat, shortness of breath, or even suffocation. When swallowed in high concentrations, ammonium nitrate may cause headache, dizziness, abdominal pain, vomiting, bloody diarrhea, weakness, a tingling sensation, heart and circulation irregularities, convulsions, collapse, and suffocation.

It also forms a mild acid when mixed with water that can cause irritation to the eyes, nose, and skin.

The laboratory pointed out that a fire from ammonium nitrate is very unlikely, "but it is a strong oxidizing agent that can cause combustible materials (such as wood, paper, and oil) to ignite."

"Only under extreme conditions of heat and pressure in a confined space will ammonium nitrate explode," it added.

Ammonium nitrate is also considered a high-risk controlled chemical in the Philippines.

Under the implementing rules and regulations of the Republic Act 9516, "an Act Imposing Stiffer Penalties for Certain Violations of Illegal/Unlawful Possession of Explosives," controlled chemicals such as but not limited to ammonium nitrate, nitric acid, hydrogen peroxide and sodium chlorite, are considered dangerous goods, since these can be used to manufacture explosives.

Therefore, for safety and security, a higher degree of due care and diligence is required when transporting this type of chemicals.

https://mb.com.ph/2020/08/06/the-powerful-explosions-in-beirut-and-tianjin-5-years-apart-both-caused-by-improper-storage-of-hazardous-chemicals/